

# PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO CONSTRUCTION APPARATUS

## ERRATUM

SPECIFICATION No. 1,405,885

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27th February, 1976

frame perpendicularly thereto, and a second order construction unit comprising an elongate rod having its two extremities curved towards the same direction, the opposed end portions of each first order parallel member and the extremities of the second order rod being in the form of male and female connectors whereby one or more basic first order units and/or one or more second order units can be assembled selectively with one or more complex first order units into a structure by mating male and female connectors of adjoining units.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings in which,

FIG. 1 is a side view of a basic first order construction unit according to the present invention,

FIG. 2 is a side view of a second order construction unit,

FIG. 3 is a perspective view of a complex first order construction unit,

FIG. 4A is a perspective view of a stabilising member,

FIG. 4B is a perspective view of a

[Price 33p]

female connectors.

In the case of the basic first order construction unit shown in FIG. 1 the two parallel laterally spaced members are each formed of a longitudinal bar 10, which bars are interconnected by one transverse bar 11 to form a basic first order construction unit of H-shape. In the case of the complex first order construction unit, the two parallel laterally spaced members are each formed of two bars 12 spaced longitudinally apart and connected by an elongate tie 13, the two parallel members being interconnected by a series of transverse bars 14, one positioned every foot along the length of the ties. Thus, the complex first order unit comprises a rectangular frame having four parallel members one at each corner thereof and perpendicular to the frame.

One or more second order construction units are provided each comprising an elongate rod 15 having each of its extremities curved to face in the same direction. The end portions of these extremities are female connections 16 matable with male connections 17 of the first order

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# PATENT SPECIFICATION

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## (54) IMPROVEMENTS IN OR RELATING TO CONSTRUCTION APPARATUS

(71) I, PATRICK GERARD MCKILLEN, "Slieve Dhu", 165, Glen Road, Belfast BT11, Northern Ireland, a British Subject, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to construction apparatus particularly but not exclusively for use by children in assembling playground equipment.

The present invention is construction apparatus for assembling into playground equipment, including a basic first order construction unit having two parallel members interconnected by a transverse bar, a complex first order construction unit having a rectangular frame and four parallel members located one at each corner of the frame perpendicularly thereto, and a second order construction unit comprising an elongate rod having its two extremities curved towards the same direction, the opposed end portions of each first order parallel member and the extremities of the second order rod being in the form of male and female connectors whereby one or more basic first order units and/or one or more second order units can be assembled selectively with one or more complex first order units into a structure by mating male and female connectors of adjoining units.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings in which,

FIG. 1 is a side view of a basic first order construction unit according to the present invention,

FIG. 2 is a side view of a second order construction unit,

FIG. 3 is a perspective view of a complex first order construction unit,

FIG. 4A is a perspective view of a stabilising member,

FIG. 4B is a perspective view of a

modified basic first order construction unit,

FIG. 4C is a perspective view of a two-piece attachment,

FIG. 5 is a perspective view of a slide formed from first order and second order construction units,

FIG. 6 is a perspective view of a combined adventure erection and a swing formed from first order and second order construction units, and

FIG. 7 is a perspective view of a roundabout formed from first order and second order construction units and an attachment shown in FIG. 4C.

Construction apparatus includes a plurality of first order construction units of a basic form and a plurality of a complex form. Each form of first order construction units comprises two parallel laterally spaced members interconnected by one or more transverse bars, the opposed ends of each member being in the form of male and female connectors.

In the case of the basic first order construction unit shown in FIG. 1 the two parallel laterally spaced members are each formed of a longitudinal bar 10, which bars are interconnected by one transverse bar 11 to form a basic first order construction unit of H-shape. In the case of the complex first order construction unit, the two parallel laterally spaced members are each formed of two bars 12 spaced longitudinally apart and connected by an elongate tie 13, the two parallel members being interconnected by a series of transverse bars 14, one positioned every foot along the length of the ties. Thus, the complex first order unit comprises a rectangular frame having four parallel members one at each corner thereof and perpendicular to the frame.

One or more second order construction units are provided each comprising an elongate rod 15 having each of its extremities curved to face in the same direction. The end portions of these extremities are female connections 16 matable with male connections 17 of the first order

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construction units. The basic first order units are each used in an upward or upwardly inclined position and the top end portions are each rebated to form the male connectors 17 having a smaller cross-sectional area than a bottom end portion, and the bottom end portions are each recessed to form the female connector 18 to accommodate a male connector of a sub-jacent first order unit. The complex first order units are each used with the parallel bars upright i.e. the ties 13 and transverse bars 14 parallel to the ground or with the ties 13 at an upward incline to the ground i.e. with the bottom female connectors 18 of opposed parallel bars 12, one bar 12 of each member, resting on the ground and the bottom connectors 18 of the other bar 12 of each member raised off the ground. The basic and complex first order and second order construction units are formed of tubular metal.

Plastic feet 19 are provided one for fitting under each bottom connectors 18 on the ground and preferably plastic ferrule plugs (not shown) are provided for location one into each male connector 17 to mask the upper edge of the metal male connector thereby to prevent possible accident when being used.

A stabilising member shown in FIG. 4A may be provided for use in stabilising an erection of basic first order units, for example a ladder as hereinafter described, the stabilising member comprising a horizontal bar 22 having two male connectors 23 similarly shaped to male end connectors 17, extending radially from bar 22 in the same direction.

A modified basic first order unit as shown in FIG. 4B is provided, the modification being that the bars 10 are correspondingly angled at a location between the female connectors 18 and the junction of the transverse bar 11.

A two-piece attachment may be provided as shown in FIG. 4C. One piece is shaped as an inverted cup 21 for location over three or four bars 10 grouped together and each bar 10 being one of a separate basic first order unit, the top of the cap having a male connector similar to male connector 23 and designated with the same number. The second piece is a horizontally disposed rectangular plate 25 having upward projections 24 at each corner, the width between the projections at each end of the plate being equal to the width of a transverse bar 14. A female connector 26 is secured under the plate for location over the male connector 23 to form a pivotal connection.

To erect a sledge (not shown), two second order construction units are fitted to one side of a complex first order construction unit in opposed parallel relation, the female

connectors 18 of the second order members mating with the male connectors 17 of the bars 12 to form the runners of the sledge, when the construction is inverted and a piece of sheet material is secured over and supported by the opposite sides of the transverse bars 14 to form a platform of the sledge.

To erect a ladder as shown as part of the construction of a slide, a swing or an adventure frame as shown in FIGS. 5 or 6, a series of basic first order units are used and are fitted one on top of the other, the female connectors 18 of a suprajacent first unit fitting over the male connectors 17 of a sub-jacent first unit. A stabilising member as shown in FIG. 4A may be provided to be attached to the base of the ladder, the connectors 23 engaging in the female connectors 18.

To erect a slide, as shown in FIG. 5 one complex first order unit, two second order units, and a series of basic first order units are used. The basic first order units are formed into a ladder as hereinbefore described and a modified basic first order unit as shown in FIG. 4B is fitted onto the top of the ladder. The complex first unit is inclined upwardly, then the male connectors 17 of the upper modified basic first unit are mated with the female connectors 18 of the raised parallel bars 12 of the complex first order unit. A stabilising member as shown in FIG. 4A may also be fitted to the bottom of the ladder. A piece of sheet material 20, longer than that used in the sledge embodiment is secured to the transverse bars 14 with the end of the sheet material terminating on or adjacent to the ground. The second order units are mounted on the complex first order unit in the same manner as for the sledge embodiment. Side panels between the second order units and the respective ties may be provided for safety.

To erect an adventure frame as shown in FIG. 6, one complex first order unit and a series of basic first order units are used. From the series of basic first order units, two ladder units are formed and the male connectors of each upper basic first unit is mated with the female connectors of one parallel bar of each member to form an inverted U-shape.

To erect a swing, as shown in FIG. 6 an adventure frame as described is used and from two adjacent transverse bars 14 the ends of chains or ropes 27 are secured to suspend therefrom, at the end of which a seat 28 is secured. FIG. 6 also shows two further complex first order units being used for stabilising purposes.

To erect a roundabout as shown in FIG. 7, one bar 10 of each of four basic first order units are grouped together with the rest of the units radiating therefrom, the outer bars

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10 of the units being equispaced, and the cup 21 (FIG. 4C) is located over the tops of the four grouped bars 10 to secure them together. The plate 25 is mounted under one transverse bar 14 at substantially mid-way of a complex first order unit. The female connector 26 and male connector 23 are mated. The roundabout so formed is used conventionally, the second piece of the attachment being friction rotated relative to the first piece.

Many more constructions can be assembled from the units. Also, the size of the units can be varied i.e. the transverse bars of the basic first order units can be provided in one foot, two foot, three foot, four foot, five foot or six foot lengths, or similar metric measurements, also the ties of the complex first order units can be provided in similar lengths as can the rods of the second order units.

#### WHAT I CLAIM IS:—

1. Construction apparatus for assembling into playground equipment, including a basic first order construction unit having two parallel members interconnected by a transverse bar, a complex first order construction unit having a rectangular frame and four parallel members located one at each corner of the frame perpendicular thereto, and a second order construction unit comprising an elongate rod having its two extremities curved towards the same direction, the opposed end portions of each first order parallel member and the extremities of the second order rod being in the form of male and female connectors whereby one or more basic first order units and/or one or more second order units can be assembled selectively with one or more

complex first order units into a structure by mating male and female connectors of adjoining units.

2. Construction apparatus as claimed in Claim 1, in which a two-piece attachment is provided comprising a first piece in the form of an inverted cup for location over a group of male connectors of basic first order units arranged to radiate from a central area in which area a male connector of each unit is located to form the group, an upstanding male connector on the cup, and a second piece having a depending female connector for location over the upstanding male connector on the cup to form a pivotal connector.

3. Construction apparatus substantially as hereinbefore described with reference to Fig. 1, Fig. 2, Fig. 3, Fig. 4A and Fig. 4B of the accompanying drawings.

4. Construction apparatus formed into a slide substantially as hereinbefore described with reference to Fig. 5 of the accompanying drawings.

5. Construction apparatus formed into a swing substantially as hereinbefore described with reference to Fig. 6 of the accompanying drawings.

6. Construction apparatus as claimed in claim 1 formed into a roundabout substantially as hereinbefore described with reference to Fig. 4C and Fig. 7 of the accompanying drawings.

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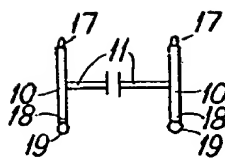


Fig. 1.

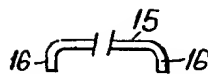


Fig. 2.

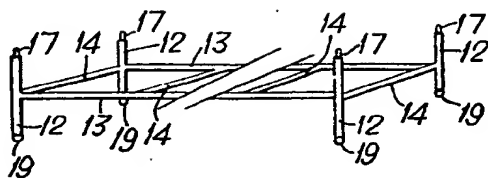


Fig. 3.

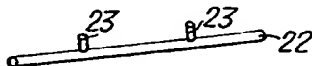


Fig. 4A.

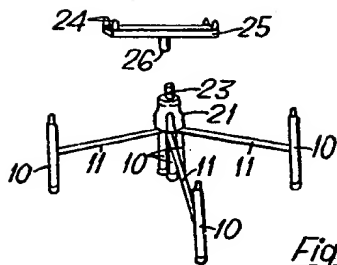


Fig. 4C.

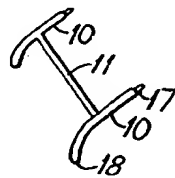


Fig. 4B.

